

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:	)	Group Art Unit: 3747
Steve Ingistov	)	Examiner: J. Kwon
Serial No.: 08/892,738	)	
Filed: July 15, 1997	)	
For: TURBINE POWER PLANT HAVING	)	January 11, 1999
MINIMAL-CONTACT BRUSH SEAL	)	
AUGMENTED LABYRINTH SEAL	)	San Bernardino, California



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AMENDMENT IN RESPONSE TO FIRST OFFICE ACTION

Assistant Commissioner for Patents  
Washington, D.C. 20231

Sir:

In response to the first office action of June 4, 1998, which was first received by the Applicant from the Examiner by fax on January 6, 1999, please amend the above-identified patent application as follows:

IN THE SPECIFICATION:

In the specification at page 1, amend the first sentence to read:

--This application is a continuation of application Serial No. 08/656,564, filed May 31, 1996, abandoned.--

At page 7, lines 24 and 26, change "18" to --24-- (two occurrences).

IN THE CLAIMS:

Please amend claims 3, 4, 20, 22, and 24, as follows:

In claim 3, line 3, delete "changeably".

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In claim 4, line 2, delete "changeably".

20. (Amended) [The method of claim 17, comprising the further steps of:] A method for controlling cooling air flow in a turbine power plant having a multistage axial compressor, a turbine shaft-coupled to a rotor of the compressor, a combustor fluid coupled between the compressor and the turbine, and a labyrinth seal between the rotor and a stationary inner barrel member, the rotor having a cylindrical land region of diameter D, comprising the steps of:

(a) providing a brush seal having a ring-shaped holder, a multiplicity of bristle members extending radially inwardly from the holder toward the land region of the rotor, outer extremities of the bristle members being rigidly retained relative to the holder;

(b) connecting the brush seal in augmenting relation to the labyrinth seal;  
and

(c) spacing the bristle members from the land region of the rotor by an ambient temperature clearance of not less than 0.015 percent of the diameter D when the power plant is inactive;

[(a)] (d) providing an auxiliary source of pressure air;

[(b)] (e) fluid-connecting the auxiliary source to an interior cavity portion of the inner barrel member for augmenting the flow of cooling air;

[(c)] (f) connecting an adjustable valve between the auxiliary source and the inner barrel member for variably restricting air flow from the auxiliary source and the inner barrel member;

[(d)] (g) monitoring an operating parameter of the power plant; and

[(e)] (h) adjusting the adjustable valve in response to changes in the operating parameter.

22. (Amended) [The engine of claim 2, further comprising] A stationary gas turbine engine for a power plant, comprising:

(a) a multistage axial compressor, the compressor having a rotor, the rotor having a cylindrical land region downstream of a last-stage of the compressor, the land region having an outside diameter D;

(b) a turbine shaft-coupled to the rotor of the compressor;

(c) a combustor fluid coupled between the compressor and the turbine;

(d) a stationary inner barrel member downstream of the compressor, air flowing from the compressor to the combustor passing outside of the inner barrel member, a chamber within the inner barrel member forming a main passage for cooling air from the

compressor, the cooling air flowing from the chamber and being mixed with combustion gases upstream of the turbine; and

(e) a brush seal for restricting air passage into the chamber from the compressor, the brush seal comprising:

(i) a ring-shaped holder;

(ii) a multiplicity of bristle members extending radially inwardly from the holder toward the land region of the rotor, outer extremities of the bristle members being rigidly retained relative to the holder; and

(iii) the holder being fastened to the inner barrel member;

(f) a barrel passage extending through one wall of the inner barrel for passing air therethrough downstream of the brush seal, thereby altering the flow of cooling air from the chamber to be mixed with the combustion gases upstream of the turbine; and

(g) an auxiliary source of pressure air connected to the barrel passage for augmenting air flow into the main passage, thereby augmenting cooling air flow from the main passage to be mixed with the combustion gases,

wherein, when the power plant is inactive, the bristles have an ambient temperature clearance of not less than 0.015 percent of the diameter D from the land region of the rotor.

24. (Amended) [The engine of claim 12, further comprising] In a turbine power plant having a multistage axial compressor, a turbine shaft-coupled to a rotor of the compressor, a combustor fluid-coupled between the compressor and the turbine, and a labyrinth seal between the rotor and a stationary inner barrel member, the rotor having a cylindrical land region of diameter D, a chamber within the inner barrel member forms a passage for cooling air from the compressor, the improvement comprising:

(a) a brush seal connected to the inner barrel and augmenting the labyrinth seal, being fluid connected in series therewith, the brush seal comprising:

(i) a ring-shaped holder;

[(b)] (ii) a multiplicity of bristle members extending radially inwardly from the holder toward the land region of the rotor, outer extremities of the bristle members being rigidly retained relative to the holder; and

[(c)] (iii) the holder being fastened to the inner barrel member;

(b) a barrel passage extending through one wall of the inner barrel for passing air therethrough downstream of the brush seal, thereby altering the flow of cooling air from the chamber to be mixed with the combustion gases upstream of the turbine;

(c) an auxiliary source of pressure air connected to the barrel passage for

augmenting air flow into the main passage, thereby augmenting cooling air flow from the main passage to be mixed with the combustion gases,

wherein, when the power plant is inactive, the bristles have an ambient temperature clearance of not less than 0.015 percent of the diameter D from the land region of the rotor.

### REMARKS

Claims 1-26 are in this application. Claims 5-8, 13-16, 20, and 22-24 were indicated to contain allowable subject matter. Applicant confirms the election to prosecute the invention of Group 1, claims 1-14 and 26. By this amendment, claims 20, 22, and 24 have been amended. Re-examination, reconsideration and allowance of this application is respectfully requested. No new matter is added. Entry of the Amendment is requested based on prompt response to fax receipt of an improperly addressed Office Action as explained below.

Applicant wishes to thank Examiner Kwon for the courtesies that were extended to the undersigned during telephone interviews on January 6 and 7, 1999, in which the Examiner inquired as to whether the application was indeed to be abandoned. It was determined that the Office Action of June 4, 1998, was sent to a wrong address, and the Examiner faxed the Office Action to the undersigned on January 7, 1999.

Claim 20 has been amended to incorporate the limitations of claim 17 as originally presented. Claim 22 has been amended to incorporate the limitations of claims 1 and 2 as previously presented. Claim 24 has been amended to include the limitations of claims 11 and 12 as previously presented.

### REJECTION UNDER 35 U.S.C. 112

Claims 2-8 and 21-23 were rejected under 35 U.S.C. 112, second paragraph, as being indefinite. It was suggested that "a structure for changeably restricting . . ." at claim 2, line

3 is indefinite. Applicant believes that the quoted phrase appears in claim 3, not claim 2. Claims 3 and 4 have been amended to delete "changeably". Accordingly, it is believed that the rejection of claims 2-8 and 21-23 under 25 U.S.C. 112, second paragraph, has been overcome by the amendment and remarks; withdrawal thereof is requested.

REJECTION UNDER 35 U.S.C. 103

Claims 1-4, 9-12, 17-19, 21, and 26 were rejected under 35 U.S.C. 103 as being unpatentable over the Bouchard reference. It was suggested that to optimize or select the suitable dimension for the seal clearance is within the ability of one of ordinary skill in the art. These rejections are believed no longer appropriate regarding claims 5-8, 13-16, 20, and 20-24, in view of the amendment of claims 20, 22, and 24 to be in independent form.

Claims 1-4, 9-12, 17-19, and 21 have been retained for preserving Applicant's rights to a possible Interference with the Bouchard patent reference.

Accordingly, it is believed that the rejections of claims 5-8, 13-16, 20, and 20-24, under 35 U.S.C. 103 have been overcome by the amendment and remarks; allowance thereof is respectfully requested.

If for some reason this Amendment cannot be entered, it is respectfully requested that a telephone call be placed to the undersigned so that appropriate remedial steps can be expedited.

Respectfully submitted,

SHELDON & MAK

Date: 11 January 1999

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